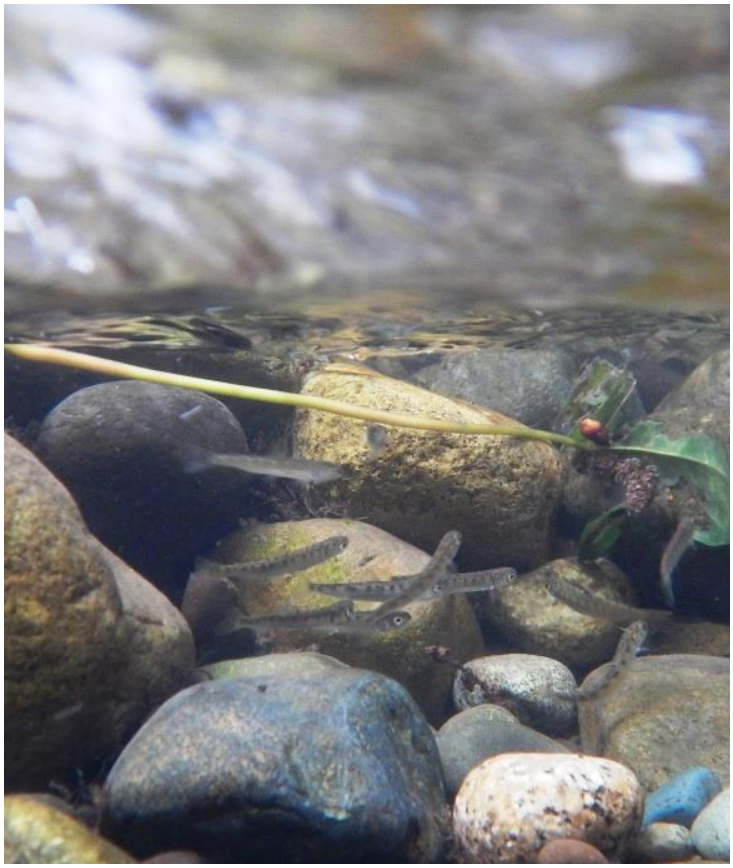
WSDOT Fish Barrier Correction

DELIVERING PROJECTS, CONNECTING HABITAT

In an effort to protect and restore salmon runs, the Washington State Department of Transportation is correcting fish barriers found on state highways. Since 1991, when WSDOT created a dedicated program, 344 barriers have been corrected, opening up a total of 1,161 miles of fish habitat. In addition to WSDOT's ongoing work to correct statewide barriers, a 2013 federal court injunction also requires WSDOT to correct culverts that are barriers to salmon and steelhead within the case area in western Washington.

As of June 2020, WSDOT has corrected 73 injunction barriers, improving access to more than 329 miles of habitat, since the establishment of the injunction. Fish barriers corrected during the 2020 construction season will be reported in WSDOT's June 2021 Fish Passage Progress Report, after compliance inspections have been completed.

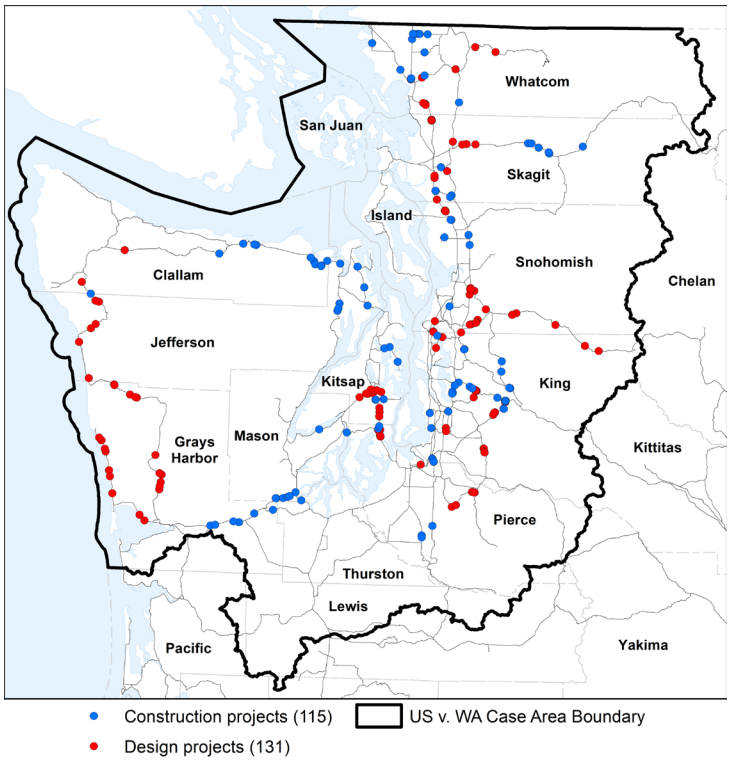


State Route 108 Little Creek barrier corrected in 2016. Chum Salmon swimming through SR 108 Little Creek culvert to spawn in the fall. Juvenile chum emerged from the gravels in early spring.

There are approximately 1,000 culverts under state highways that are subject to this injunction. In addition to the barriers already corrected, WSDOT must correct approximately 400 remaining injunction barrier culverts by the year 2030.

Opening up habitat allows more salmon and steelhead at all life stages (including juveniles who aren't yet strong swimmers like adults) to access important spawning and rearing habitat, including areas that haven't been accessed in years. Using structures like bridges and culverts that allow for natural stream conditions helps protect and restore salmon runs, ultimately benefiting both the Pacific Northwest landscape and economy.

WSDOT's 21-23 fish passage projects within the culvert case area



INVESTING IN FISH PASSAGE

While funding for stand-alone fish passage projects is increasing, additional funding is needed to comply with the culvert injunction by 2030. The table below shows the current available funding and the additional funding needed. A total of $2.4 billion is needed, in addition to the current funding, to meet the 2030 deadline.

Injunction Compliance Investment Levels

	Past Biennia 2013-2019	Current Biennium 2019-2021	2021-2023	2023-2025	2025-2027	2027-2029	2029-2030	Total
Current funding	$185M	$275M	$726M	$100M	$21M	$53M	$33M	$1.4B
Total funding needed to comply with the Injunction	$185M	$275M	$726M	$730M	$735M	$740M	$405M	$3.8B
Additional funding required				$630M	$714M	$687M	$372M	$2.4B
# Barriers (Corrected)	66	24	90-110	115-130	115-130	115-130	30-40	580-600

M=Millions B=Billions

- Opens 90% of blocked habitat by 2030 as required by the injunction.
- Includes funds to correct culverts that structurally fail as required by the injunction.
- Includes a small amount of funding for high value corrections outside the case area.
- Funding needed after 2030 to continue correcting fish barriers.

CONSIDERATIONS FOR CORRECTING WSDOT FISH BARRIERS

Many factors can influence the cost of correcting barriers at state highways:

- **Site Characteristics** – each fish passage site is unique and requires different amounts of excavation and grading to build streambeds and remain structurally stable.
- **Traffic Control** – WSDOT needs to keep traffic moving during construction, which increases costs for flagging, building detours, or building half the project at a time.
- **Right of Way** – nearly all barrier corrections require working with adjacent property owners to obtain property rights to connect the new stream channel with the existing one.
- **Design Elements** – standards for traffic load and seismic resiliency must be included, in addition to public safety features like guardrail, barrier, striping and signing.
- **Utilities** – internet, electricity and other vital services commonly run along state highways and might need to be moved before construction occurs to maintain connections to adjacent communities.
- **In-water Work Windows** – these projects require in-water work, which is typically only allowed for about two months a year during the summer to protect fish.
- **Coordination** – WSDOT coordinates with many different stakeholders and partners, including private and public property owners, local jurisdictions, businesses, utility companies, resource agencies, and tribes.

Project example: Barrier correction at State Route 6 Salmon Creek, constructed in 2019

WSDOT replaced an undersized culvert with a bridge, which included minor channel grading downstream and upstream to mimic natural stream conditions. This project restored fish passage and natural stream processes such as transport of sediment and wood. The bridge, costing $2.4 million, corrected an injunction barrier and opened 3.6 miles of habitat for salmon and steelhead. This project builds upon previous restoration efforts on Salmon Creek. Washington State Parks replaced the downstream barrier crossing for the Willapa Hills Trail with a fish passable bridge in 2015. These efforts together improve stream function and fish access.

STRATEGIES FOR ACHIEVING EFFICIENCIES IN WSDOT'S FISH PASSAGE PROGRAM

WSDOT uses these approaches to help efficiently deliver fish passage projects:

- Prioritizing barrier corrections based on habitat gain, tribal input, partnership opportunities, public impacts, culvert condition, and other factors.
- Bundling a larger number of barrier corrections into single contracts, which is more efficient for design and construction, and reduces impacts to travelling public.
- Utilizing the design-build method of delivery on larger bundles of barriers to provide innovative solutions and reduce WSDOT staffing needs.
- Coordinating WSDOT's delivery plan with the Fish Barrier Removal Board, cities, counties, and others to leverage the benefits of corrections in watersheds like the Kilisut Harbor bridge.
- Pursuing initiatives to acquire real estate earlier in the design process. This reduces the potential for delays in securing necessary property rights.
- Identifying utilities affected by the delivery plan so utility companies have lead time to relocate utilities.
- Increasing design efforts significantly through the addition of specialized fish passage WSDOT design teams and consultants delivering projects.
- Adding regulatory staff dedicated to WSDOT fish passage in order to expedite approvals and pursuing programmatic permits/approval.

State Route 116 Kilisut Harbor bridge

The Kilisut Harbor bridge on State Route 116 was constructed in 2020 in partnership with North Olympic Salmon Coalition (NOSC), with funding from WSDOT, US Fish & Wildlife Service, US Navy, NOAA Fisheries, US Federal Highway Administration, Estuary & Salmon Restoration Program, and the Puget Sound Acquisition and Restoration Fund. Other project partners include: Port Gamble S'Klallam Tribe, Elwha Klallam Tribe, Jamestown S'Klallam Tribe, Hood Canal Coordinating Council, Jefferson County, Salmon Recovery Funding Board, Washington State Department of Natural Resources, Puget Sound Partnership, and Washington State Department of Ecology.

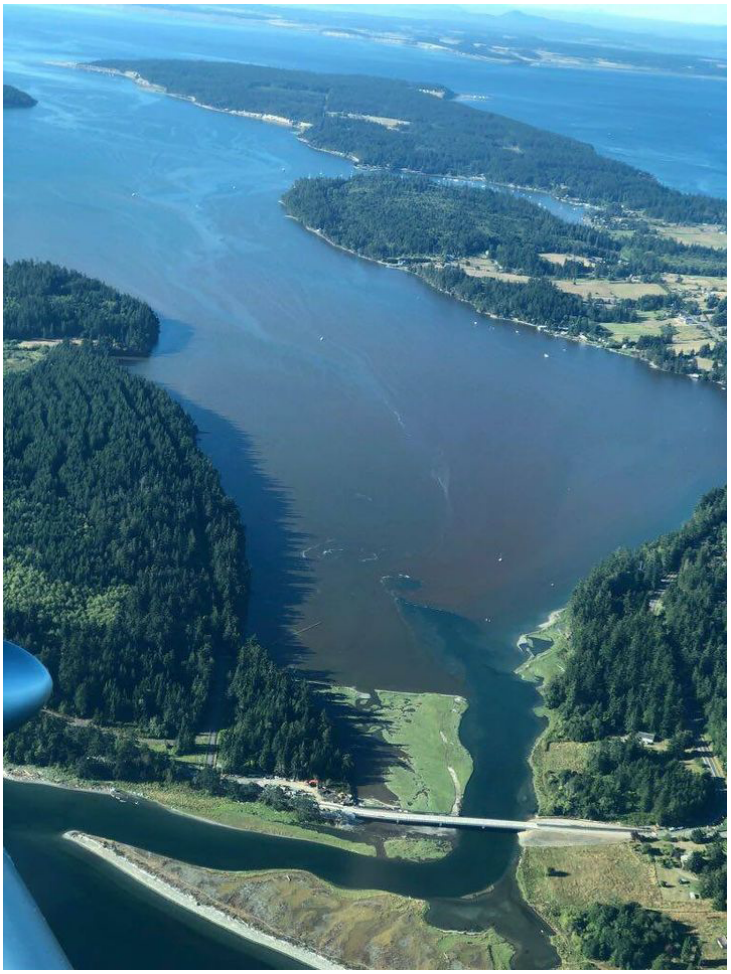


Photo courtesy of Dean L. Sanders Photography

The Kilisut Harbor Restoration Project restored fish passage and tidal connection between southern Kilisut Harbor (Scow Bay) and Oak Bay by removing the earthen causeway that contained two 5-foot box culverts. The causeway was replaced with a 440-foot bridge. These actions on SR 116 restore natural processes and biological responses to 27 acres of marine intertidal habitat and tidal-fringe salt marsh that have been severely impacted by the construction of the earthen causeway. This project not only provides transportation between two islands but also provides habitat for foraging fish like juvenile salmonids within Kilisut Harbor. Fish have already been observed in some of the newly constructed tidal channels.

The extensive partnership allowed significant restoration benefits beyond what a WSDOT fish passage project would have accomplished alone.

State Route 203 Loutsis Creek bridge

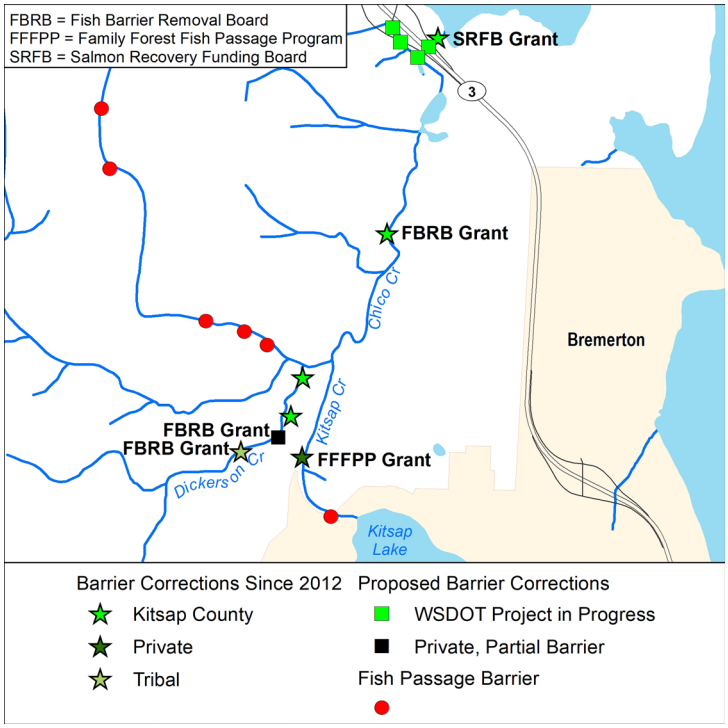
The Loutsis Creek bridge on State Route 203 was constructed in 2020, and is the first bridge of its kind on the West Coast (Picture 1), using fiberglass forms to build the concrete structure (Picture 2). The fiberglass forms are hollow arched tubes with an opening that concrete is pumped into. They are relatively light – a 50-foot-long, 1-foot-diameter pipe weighs about 200 pounds. Once the arches are in place, fiberglass panels are inserted between them and the concrete is poured inside. After curing, fill was placed over the top and the highway repaved. This new method, referred to as 'bridge in a backpack,' is an innovative approach for situations where crane access is difficult or where the span is large (and the pieces are heavy).

Picture 1

Picture 2

PART OF A LARGER RESTORATION EFFORT

WSDOT's efforts to correct fish passage barriers are making an important contribution to salmon and steelhead recovery in Washington. The agency is working with project sponsors and the Fish Barrier Removal Board to leverage WSDOT investments in fish passage projects with other fish barrier corrections in the same watersheds. The map on this page shows an example where WSDOT, the Fish Barrier Removal Board, the county, tribe, and others are making investments in the Chico Creek watershed.



When WSDOT and others partner to correct fish barriers, these combined efforts can open up more habitat, which benefits the entire watershed. WSDOT is currently designing a bridge and plans to correct the barrier at State Route 3 Chico Creek during the 2021-2023 biennium. Chico Creek and tributaries provide more than 20 miles of habitat for Chinook, chum, and coho salmon, steelhead, searun cutthroat, and resident trout.

MAKING SURE IT'S WORKING AFTER CONSTRUCTION

Monitoring helps ensure barrier corrections are functioning as designed. WSDOT conducts post-project monitoring to verify structures are fish passable. Washington State Department of Fish & Wildlife biologists conduct field surveys upstream to look for adult salmon and steelhead use. Fish have been observed spawning upstream at more than half of the WSDOT fish passage projects constructed in recent years. However, in some cases, it may take years before fish use the newly opened habitat, particularly if the fish numbers are low in the watershed or there are other barriers in the system that still need correction.

Fish inside the new culvert

Soon after correcting the barrier at Schoolyard Creek under State Route 530, crews spotted an adult salmon inside the newly constructed culvert.

MORE INFORMATION

Paul Wagner
Biology Branch Manager
360.705.7406
Paul.Wagner@wsdot.wa.gov
www.wsdot.wa.gov/Projects/FishPassage

21-03-0053